

WHAT IS CLAIMED IS:

1. A transmission method comprising:

transmitting a plurality of packets in multiplexing manner, which header in each packet includes a first field
5 holding a signal indicative of a packet length, a second field holding a signal indicative of a preferential order upon transferring the packet, a third field holding a signal indicative of a kind of traffic, a fourth field holding a signal indicative of a header length, a fifth field holding a control
10 signal depending upon the kind of traffic, and a sixth field holding a signal indicative of a result of CRC operation of the header, a payload holding information signal depending upon kind of the traffic and a signal indicative of a result of CRC operation of the payload.

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2. A transmission method as set forth in claim 1, wherein, said traffic is one or more kinds among a synchronous transmission mode, asynchronous transmission mode and an internet protocol.

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3. A transmission method as set forth in claim 1, wherein said payload have a maximum length and a variable length.

4. A transmission method as set forth in claim 2, wherein
25 said fifth field is consisted of a field holding a signal

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indicative of a destination address, a field holding a signal
indicative of a sender address, a field holding a remote alarm
indicative of an alarm condition in a remote station, and a
field holding a remote monitor indicative of a signal receiving
5 condition of the remote station, and said header forms a header
of the packet for transmitting a synchronous transmission mode
signal.

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5. A transmission method as set forth in claim 2, wherein
10 said fifth field is consisted of a field holding a signal
indicative of a destination address, a field holding a signal
indicative of a sender address and a field reserved for future
use, and said header is a header of the packet for transmission
of an asynchronous transmission mode cell.

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6. A transmission method as set forth in claim 2, wherein
said fifth field is consisted of a field holding a signal
indicative of a label and a field reserved for future use, and
said header is a header for transmitting the packet according
20 to IPv4 or IPv6 using a label technology.

7. A transmission method as set forth in claim 2, wherein
said fifth field is consisted of a field holding a signal
indicative of a destination address and a field holding a route
25 information and an identifier for controlling traffic class

and flow spreading, and said header is a header for transmitting the packet according to IPv4 or IPv6 using an address in a network.

5 8. A transmission method as set forth in claim 4, wherein said header further includes a extendable field by option following said sixth field.

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10 9. A transmission method as set forth in claim 1 wherein said multiplexed packet further includes an OAM packet used for maintenance of a network and management of operation, and stuff bytes for maintaining a period of the multiplexed packet.

15 10. A transmission method as set forth in claim 9, wherein said OAM packet is consisted of a field holding a byte for automatic protection switch, a field holding an order wire, a field of holding a data communication channel, a first holding a remote alarm indicative of alarm condition in the remote station, and a field holding a remote monitor indicative of
20 the signal receiving condition in the remote station.

11. A transmission method as set forth in claim 9, wherein said stuff byte and said first field holding the signal indicative of the packet length are converted into a complete
25 representation system with taking a predetermined offset as

12. A network system comprising:

a receiving portion separating said packet received from
20 said relay node and inputting to a switching equipment, an
asynchronous transmission mode switch or internet protocol
router after performing a predetermined speed changing
process.

25 13. A network system as set forth in claim 12, wherein, said

14. A network system as set forth in claim 12, wherein said
5 payload a maximum length and a variable length.

16. A network system as set forth in claim 13, wherein said fifth field is consisted of a field holding a signal indicative of a destination address, a field holding a signal indicative of a sender address and a field reserved for future use, and said header is a header of the packet for transmission of an asynchronous transmission mode cell.

17. A network system as set forth in claim 13, wherein said
25 fifth field is consisted of a field holding a signal indicative

of a label and a field reserved for future use, and said header is a header for transmitting the packet According to IPv4 or IPv6 using a label technology.

5 18. A network system as set forth in claim 13, wherein said fifth field is consisted of a field holding a signal indicative of a destination address and a field holding a route information and an identifier for controlling traffic class and flow spreading, and said header is a header for transmitting the
10 packet according to IPv4 or IPv6 using an address in a network.

15 19. A network system as set forth in claim 15, wherein said header further includes a extendable field by option following said sixth field.

20 20. A network system as set forth in claim 13, wherein said multiplexed packet further includes an OAM packet used for maintenance of the network and management of operation, and stuff bytes for maintaining a period of the multiplexed packet.

25 21. A network system as set forth in claim 20, wherein said OAM packet is consisted of a field holding a byte for automatic protection switch, a field holding an order wire, a field of holding a data communication channel, a first holding a remote alarm indicative of alarm condition in the remote station, and

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a field holding a remote monitor indicative of the signal receiving condition in the remote station.

22. A network system as set forth in claim 20, wherein said
5 stuff byte and said first field holding the signal indicative
of the packet length are converted into a complete
representation system with taking a predetermined offset as
a law for preventing them from generating continuous "0".

10 23. A network system as set forth in claim 20, wherein said
transmitting portion comprises:

(a) a switching equipment constituted of a digital
subscriber transporting device, a local switching equipment
or a tandem switching equipment, a signal processing portion
15 processing a synchronous transmission mode signal output from
said switching equipment, a synchronous transmission mode
processing portion recognizing a leading position of said
synchronous transmission mode signal and a data length, a first
FIFO storing an output of said signal processing portion, a
20 second FIFO storing an output of said synchronous transmission
mode processing portion, a first packet composing portion input
an output of said first FIFO and a second packet composing
portion input an output of said FIFO;

(b) an asynchronous transmission mode switch, an
25 asynchronous transmission mode cell order controlling portion

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input an asynchronous transmission mode cell output from said asynchronous transmission mode switch, a third FIFO storing an output of said asynchronous transmission mode cell order controlling portion and a third packet composing portion input
5 an output of said third FIFO;

(c) an internet protocol router, an internet protocol preference control portion input an internet protocol packet data output from said internet protocol router, a fourth FIFO storing an output of said internet protocol preference control
10 portion and a fourth packet composing portion input an output of said fourth FIFO; and

(d) a packet multiplexing portion multiplexing outputs of said first, second, third and fourth packet composing portions, a stuff byte generating portion generating
15 a predetermined stuff byte for outputting, and an OAM packet generating portion generating an OAM packet for outputting.

24. A network system as set forth in claim 20, wherein said relay node comprises a packet synchronization circuit
20 establishing synchronization of the packet using the result of CRC operation of the header included in the packet per input path and the stuff byte, a physical phase/data integrated switch determining an output path of each packet with reference to the destination address or label in the header of the packet,
25 and a packet frame forming portion for re-forming a frame of

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said packet using the stuff byte.

25. A network system as set forth in claim 24, wherein said packet synchronization circuit uses $X^{16} + X^{12} + X^5 + 1$ as
5 generating polygonal expression in said CRC operation of said header.

26. A network system as set forth in claim 24, wherein said packet synchronization circuit establishes synchronization
10 using the stuff byte.

27. A network system as set forth in claim 20, wherein said receiving portion comprises:

(a) a packet demultiplexing portion separating
15 received packets and an OAM packet detecting portion for detecting the OAM packet;

(b) a first packet decomposing portion processing a signaling packet in synchronous transmission mode input from the packet demultiplexing portion for generating and
20 outputting data, clock and a primitive, a first speed changing portion generating an original clock in the sender on the basis of a received clock, a second packet decomposing portion processing the packet in synchronous transmission mode input from the packet demultiplexing portion for generating and
25 outputting data, clock and a primitive, a second speed changing

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portion generating an original clock in the sender on the basis
of a received clock, a switching equipment constituted of the
digital subscriber transporting device, local switching
equipment or a tandem switching equipment and receiving an
5 outputs of said first and second speed changing portions;

(c) a third packet decomposing portion processing a
signaling packet in asynchronous transmission mode input from
the packet demultiplexing portion for generating and
outputting data and clock, a third speed changing portion
10 generating an original clock in the sender on the basis of a
received clock, and the asynchronous transmission mode switch
receiving an outputs of said third speed changing portion; and

(d) a fourth packet decomposing portion processing a
signaling packet in internet protocol input from the packet
15 demultiplexing portion for generating and outputting data and
clock, a fourth speed changing portion generating an original
clock in the sender on the basis of a received clock, and the
internet protocol router receiving an outputs of said fourth
speed changing portion.

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28. A network system as set forth in claim 27, wherein said
speed changing portion comprises a buffer memory storing the
clock output from the packet decomposing portion and a PLL
extracting an average frequency of the clock before being
25 stored in the buffer memory for reading out the clock stored

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in the buffer memory according to the clock of the average frequency.

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